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09/863,638	05/23/2001	Steven B. Cohen	9747	1035

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EXAMINER

EHICHIOYA, FRED I

ART UNIT	PAPER NUMBER
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2162

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/863,638	<b>Applicant(s)</b> COHEN, STEVEN B.	
	<b>Examiner</b> Fred I. Ehichioya	<b>Art Unit</b> 2172	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 - 30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments, with respect to claims 1 – 30, filed June 7, 2004 have been fully considered but they are not persuasive for the following reasons.

2. Applicant argues:

(a) Ross does not show or suggest "distributing, in response to the join request, rows and one or more columns of the first table from the first storage module to the second storage module...." (Page 8, Paragraph 3).

(b) Pederson does not show or suggest a "first access module adapted to further distribute row identifiers of distributed rows...." (Page 9, Paragraph 1).

(c) Applicant believes that any attempt to combine the Ross and Pederson patents is improper. One major... which violates this key feature of the Ross system (Page 9, Paragraph 2).

3. Examiner respectfully disagrees with all of the allegations as argued. Examiner, in his previous office action, pointed out exact locations in the cited prior art.

In response to Applicant's argument (a): Examiner respectfully disagrees with the applicants. Ross anticipates the limitations of the claims that the applicant argued. Ross discloses "distributing, in response to the join request, rows and one or more columns of the first table from the first storage module to the second storage module...."

(Ross discloses this as shown in column 7, lines 39 - 60; "FIG. 2A shows a first input data table 201 which includes columns of data entitled Student name 201A and their Course number 201B. Also included with table 201 is a column of sequential record identifiers 201C which shows the order of the records in this example. A set of numbers 201C do not in practice appear with the table 201, but are present only for this explanation. Table 205 is a table to be joined with table 201 and includes columns of data entitled Course number 205A and its Instructor 205B. Also included for this explanation is a column of sequential record identifiers 205C which shows the order of the records in this example. The data contained in the two tables are to be joined together producing a join result only of records of each table which fulfill a desired join condition. For this example, only records from first table 201 which have the same course number as records in second table 205 will be in the join result. Additionally, all columns in first table 201 and second table 205 will be present in the join result so that the join result will have a student column a course column and an instructor column. It is also possible to select only some of the columns from the input tables to become part of the join result". This fairly shows or suggests "distributing, in response to the join request, rows and one or more columns of the first table from the first storage module to the second storage module...." as claimed.

In response to Applicant' argument (b): Examiner respectfully disagrees with the applicants. Pederson anticipates the limitations of the claims, which the applicant argued.

Pederson discloses "first access module adapted to further distribute row identifiers of distributed rows...." in column 3, lines 43 – 49 and column 6, lines 31 - 61. Pederson discloses "access module processor (AMP)" as "access module" and the "hash partitioning keys" are the columns and rows identifiers. Pederson also discloses "the hash partitioning key comprises the join columns from the base table that are expressed in the star query as connections to the dimension tables. In the preferred embodiment, the distinct sub-portions of the base table are spread across the AMP nodes 12 and stored on the DSUs 16 attached to the AMP nodes 12. Rows from all of the dimension tables are selected and projected according to the other selection criteria (if any) in the query and are duplicated on all AMP nodes 12, each in their own temporary table". This clearly show or suggest applicant's claimed invention.

In response to Applicants' argument (c): MPEP 2143.02 states that "the prior art can be modified or combined to project claims as *prima facie* obvious as long as there is reasonable expectation of success. See *In re Merck & CO., In.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Therefore, the combination of Ross and Pederson Patents is proper since this combining produces a system that optimizes SQL queries in a relational database management system. The advantage of this optimization technique is that it can be applied to very large databases to produce reasonable amount of success.

4. In view of the above, the examiner contends that all limitations as recited in the claims have been addressed in this Action. For the above reasons, Examiner believed that the rejection of the last Office action was proper.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 3, 4, 5, 6, 7 are rejected under 35 U.S.C 102(b) as been anticipated by U.S. Patent 5,666,525 issues to Kenneth A. Ross (hereinafter "Ross").

Regarding claim 1, Ross teaches a method for use in a database system having plural storage modules, comprising:

storing rows of a first table in a first storage module (see column 7, lines 39 – 43);

storing rows of a second table in a second storage module (see column 7, lines 45 – 50);

receiving a request to perform a join of the first and second tables (see column 7, lines 50 – 52);

distributing, in response to the join request, rows and one or more columns of the rows of the first table from the first storage module to the second storage module (see column 7, lines 39 - 60); and

sending row identifiers of the distributed rows with the distributed rows (see column 7, lines 65 – 67 and column 8, lines 1 – 6).

Regarding claim 2, Ross teaches identifying the one or more columns of the first table that are part of one or more conditions of the join request (see column 5, lines 49 – 54 and column 7, lines 7 – 9).

Regarding claim 3, Ross teaches identifying the one or more columns that are part of the one or more conditions comprises identifying the one or more columns that are part of a join condition of the join request (see column 5, lines 65 – 67 and column 8, lines 26 – 27).

Regarding claim 4, Ross teaches identifying the one or more columns that are part of the one or more conditions further comprises identifying the one or more columns that are part of a residual condition of the join request (see column 6, lines 41 – 45 and column 8, lines 30 – 32).

Regarding claim 5, Ross teaches distributing the one or more columns does not comprise distributing columns that are part of a specified result list in the join request (see column 8, lines 38 – 42).

Regarding claim 6, Ross teaches distributing the one or more columns does not comprise distributing columns that are part of a subsequent operation specified in the join request (see column 8, lines 47 – 51).

Regarding claim 7, Ross teaches distributing the one or more columns does not comprise distributing columns that are part of a subsequent operation specified in the join request (see column 8, lines 51 – 56).

6. Claims 22, 23, 24, 25, 26, 27, 28, 29 and 30 are rejected under 35 U.S.C 102(b) as been anticipated by U.S. Patent 5,864,842 issues to Donald Raymond Pederson et al (hereinafter "Pederson").

Regarding claim 22, Pederson teaches a database system comprising:  
a plurality of storage modules, with a first storage module storing rows of a first table and a second storage module storing rows of a second table (see column 4, lines 35 – 45);

a plurality of access modules adapted to manage access of respective storage modules, a first access module corresponding to the first storage module, and a second access module corresponding to the second storage module (see Fig.1 (AMP12, DSU16 – column 1 of Fig.1 and AMP12, DSU16 – column 2 of Fig.1); and

the first access module adapted to distribute rows of the first table to the second access module in response to a join request, the first access module adapted to further distribute row identifiers of the distributed rows with the distributed rows (see column 3, lines 43 – 49 and column 6, lines 31 - 61).



Regarding claim 23, Pederson teaches the distributed rows contain one or more columns that are part of one or-more-join conditions of the join request but do not contain one or more columns that are in a specified result list of the join request (see column 4, lines 35 – 37 and column 5, lines 45 – 50).

Regarding claim 24, Pederson teaches the distributed rows do not contain one or more columns that are part of a subsequent operation specified in the join request (see column 8, lines 16 – 25).

Regarding claim 25, Pederson teaches each row of the first table is associated with a primary index, and wherein each row identifier comprises a hash code of the primary index and a uniqueness value (see column 3, lines 59 – 64).

Regarding claim 26, Pederson teaches the first table is hash partitioned and hash ordered (see column 1, lines 64 – 67).

Regarding claim 27, Pederson teaches the first table is hash partitioned and value ordered, and wherein each row of the first table is associated with a primary index, and wherein each row identifier comprises a hash code of the primary index and a field used for value ordering (see column 3, lines 59 – 67).

Regarding claim 28, Pederson teaches the first table is value partitioned and hash ordered, and wherein each row of the first table is associated with a primary index, and wherein each row identifier comprises a hash code of the primary index, a uniqueness field, and a field used for value partitioning (see column 1, lines 64 – 67 and column 2, lines 1 – 7).

Regarding claim 29, Pederson teaches the first table is value partitioned and value ordered, and wherein each row identifier comprises at least one field used for one of value partitioning and for value ordering (see column 6, lines 46 – 49).

Regarding claim 30, Pederson teaches a database system comprising:  
a plurality of storage modules, with a first storage module storing rows of a first table and a second storage module storing rows of a second table (see column 4, lines 35 – 45);

A plurality of access modules adapted to manage access of respective storage modules, a first access module corresponding to the first storage module, and a second access module corresponding to the second storage module (see Fig.1 (AMP12, DSU16 – column 1 of Fig.1 and AMP12, DSU16 – column 2 of Fig.1); and

the first access module adapted to distribute rows of the first table of the second access module in response to a join request, the first access module adapted to further distribute row identifiers with the distributed rows (see column 3, lines 43 – 49),

the first access module adapted to further distribute columns of the first table that are part of one or more join conditions of the join request but to not distribute columns of the first table that are part of a specified result list in the join request and subsequent operation of the join request (see column 8, lines 11 – 23).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ross in view of Pederson.

Regarding claim 8, Ross does not explicitly teach storing, in the second storage module, the distributed rows and one or more columns.

Pederson teaches storing, in the second storage module, the distributed rows and one or more columns (see column 3, lines 35 – 45).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine teaching of Ross with the teaching of Pederson wherein access module processor (AMP) nodes manage one or more data storage units. The AMP stores some of the rows of each table. The motivation is that since rows of the

tables are evenly distributed among the AMP, the query in the relational database management system is optimized.

Regarding claim 9, Pederson teaches storing the distributed rows and one or more columns comprises storing in a spool table (see column 4, lines 35 – 42).

Regarding claim 10, Pederson teaches the second storage module is associated with an access module, the method further comprising performing a join, by the access module, of the spool table and the second table (see Fig.1; column 2, lines 11 – 15 and column 3, lines 16 - 17).

Regarding claim 11, Ross teaches performing the join comprises identifying rows of the second table that satisfy one or more conditions of the join request and sending one or more columns of the identified rows from the second storage module to the first storage module (see column 9, lines 5 – 12).

Regarding claim 12, Ross teaches sending the one or more columns of the identified rows comprises sending one or more columns of the second table that are part of the specified result list of the join request and that are part of a subsequent operation specified in the join request (see column 9, lines 25 – 31).

Regarding claim 13, Ross teaches the first storage module is associated with one other access module, the method further comprising selecting, by the one other access module, rows of the first table corresponding to the identified rows of the second table and placing the selected rows of the first table and identified rows of the second table into a result table (see column 9, lines 34 – 45).

Regarding claim 14, Ross teaches generating a temporary index based on the spool table, the temporary index to match a column of the second table to a row identifier in the spool table (see column 9, lines 36 – 39).

Regarding claim 15, Ross teaches an article comprising at least one storage medium containing instructions executable in a database system having plural access modules to control access of plural storage modules, the instructions when executed causing the database system to:

- store rows of a first table (see Ross, column 7, lines 39 – 43) with a first access module (see Pederson, Fig.1; column 3, lines 45 – 49);

- store rows of a second table (see Ross, column 7, lines 45 - 50) with a second access module (see Pederson, Fig.1; column 3, lines 45 – 49);

- receive a join request to join the first table and second table (see Ross, column 7, lines 50 – 52);

- identify one or more columns of the first table that are part of one or more conditions of the join request (see Ross, column 7, lines 50 – 60); and

Ross does not explicitly teach access module and distribute the identified one or more columns of the first table from the first access module to the second access module but not distributing columns of the first table that are part of a specified result list of the join request.

Pederson teaches access module (see Fig.1; column 3, lines 45 – 49; distribute the identified one or more columns of the first table from the first access module to the second access module but not distributing columns of the first table that are part of a specified result list of the join request (see column 4, lines 35 – 37 and column 6, lines 37 – 41).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine teaching of Ross with the teaching of Pederson wherein access module processor (AMP) nodes manage one or more data storage units. The AMP stores some of the rows of each table. The motivation is that since rows of the tables are evenly distributed among the AMP, the query in the relational database management system is optimized.

Regarding claim 16, Ross teaches the instructions when executed cause the database system to further:

distribute rows containing the one or more identified columns of the first table (see column 7, lines 52 – 57); and

distribute row identifiers of the distributed rows with the distributed rows (see column 12, lines 52 – 56).

Regarding claim 17, Ross teaches the instructions when executed cause the database system to receive, by the first access module, rows of the second table that satisfy the one or more join conditions of the join request (see column 9, lines 34 – 38).

Regarding claim 18, Ross teaches the instructions when-executed cause the database system to receive the rows of the second table by receiving rows containing one or more columns of the second table that are part of the specified result list in the join request (see column 10, lines 17 – 26).

Regarding claim 19, Ross teaches the instructions when executed cause the database system to receive the rows of the second table containing one or more further columns that are part of a subsequent operation specified in the join request (see column 10, lines 26 – 37).

Regarding claim 20, Ross teaches the instructions when executed cause the database system to further not distribute columns of the first table that are part of a subsequent operation specified in the join request (see column 11, lines 1 – 10 and column 13, lines 6 – 10).

Regarding claim 21, Ross teaches the instructions when executed cause the database system to further:

receive the row identifiers of the first table along with the rows of the

second table (see column 11, lines 10 – 15);

retrieve rows from the first table using the row identifiers (see column 8, lines 63 – 67); and

storing rows of first and second tables in a result table (see column 8, line 67 and column 9, lines 1 – 5).

### ***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred I. Ehichioya whose telephone number is 703-305-8039. The examiner can normally be reached on M - F 8:00 AM to 4:30 PM.



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Breene can be reached on 703-305-9790. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Fred I. Ehichioya  
Examiner  
Art Unit 2172

September 21, 2004

A handwritten signature in black ink, appearing to read 'Alford Kindred', written in a cursive style.

**ALFORD KINDRED**  
**PRIMARY EXAMINER**